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THE VETERINARY JOURNAL

A Monthly Review of Veterinary Science.

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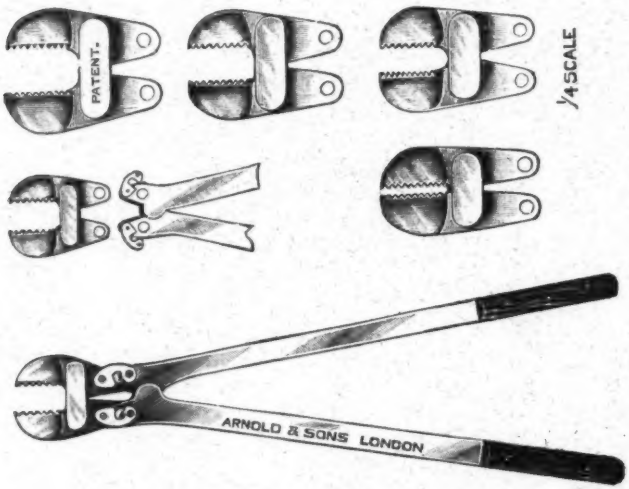

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Facing p. 565

M. CLAUDE BOURGELAT.

The Founder of the first Veterinary School
(Lyons, France, 1712).

THE

VETERINARY JOURNAL

OCTOBER, 1912.

M. BOURGELAT
(THE FOUNDER OF VETERINARY SCHOOLS).

THE bicentenary of the foundation of the first Veterinary School will be celebrated with great impressiveness at Lyons early this month. The whole veterinary world will be interested in these proceedings, as it has reason to rejoice at the cause.

M. Bourgelat was born at Lyons in 1712 of a well-known and highly respected family. His parents had destined him for the Civil Service, but the youth's own tastes lay in the direction of horsemanship and of all that pertains to the study of the "noble animal."

He began his career as proprietor of a riding school in his native town, and eventually became Commissary-General of Studs throughout the Kingdom.

In addition to his great practical activities he was a prolific and instructive writer on veterinary subjects, but nevertheless found time to interest himself in municipal affairs. Early in his life he became a councillor, and he was able to utilize this influence in the furtherance of his cherished scheme for the promotion of veterinary science; thus he was enabled to found the celebrated Veterinary School at Lyons, than which he could not have left a more appropriate and living monument to his memory.

V. D.

Editorial.

INSURANCE COMPANIES AND VETERINARY SURGEONS' FEES.

The inadequate fees for professional services paid by insurance companies to veterinary surgeons have for some considerable time given rise to complaints on the part of members of our profession, and it is high time that some serious change be made in that connection. We do not attach too much blame to the Companies, for they have apparently found little difficulty in obtaining the services of veterinary surgeons for extraordinarily small fees, and it is not to be expected that they would offer more unless some pressure was brought to bear upon them. At the present time it is the custom to offer such fees as half-a-crown or three shillings to a professional man to examine a horse as to health, and he may be asked to go some miles for the purpose. He is generally informed that he is not expected to make a purpose journey, and that it will do when he happens to be in the district where the animal is; but unless he makes a point of being in that district in the next few days he is asked if it is his intention to execute the commission, for if not somebody else must be sent. Now, if the horse in question happens to belong to a client of that veterinary surgeon he is somewhat reluctant to offer, as it were, a free entry to that client's premises to an opposing practitioner, and so he yields, in spite of the fact that the fee would not even pay for car hire for the journey. In this subtle way pressure is brought to bear, and it is for us to ask for better terms, and unless they are granted to combine and refuse to accept such fees. The agent who procures the business is paid from 12½ per cent. to 15 per cent. of the premium, and he needs no professional skill whatever. The professional man, whose services also are essential to a successful issue of the business, is offered from 2½ per cent. to 5 per cent. of the premium. This disproportion is very considerable, as is shown by a specific case in which a horse was insured for £80, the agent being paid 17s. 6d., and the veterinary surgeon 4s. for his journey of 4½ miles and the examination of the horse. To remedy matters to some extent, some practitioners accept an agency and so obtain both fees, but this is not as it should be,

and professional work should certainly not be less well paid than purely clerical work.

The newly-formed South-eastern Veterinary Society is to be congratulated for having so energetically started the crusade against these absurd fees, and we compliment the President, Mr. Jas. Crowhurst, F.R.C.V.S., for having so energetically brought the matter forward in his presidential address and in a subsequent discussion on the subject at the Society's meeting at Tunbridge Wells. At the meeting some very absurd specific cases were quoted. One professional man had been asked to examine three horses seven miles away for the sum of half-a-crown each. Another was offered three shillings and sixpence to examine a horse five miles away. Another was offered three shillings and sixpence to inspect three bullocks; he refused to do it, but as the animals belonged to a client he offered to do it for seven shillings and sixpence, which was readily paid by the Company. The last example shows that the Companies are amenable to reason and would probably grant an adequate scale of fees if the matter was placed before them in a reasonable way. If the Companies refused to meet us our only solution of the difficulty is to refuse to do the work at all. The Companies would then be far worse losers, as numerous cases could be quoted to illustrate. We will, however, only mention one case in which we were requested to inspect a cow said to have been killed by lightning. The circumstances of the case were suspicious of death by lightning, there having been a severe thunderstorm during the night and the animal was found dead early in the morning. In the absence of a proper *post-mortem* examination by a veterinary surgeon, or as a result of the cursory glance such as is warranted by the present absurd fees to busy men, the Company would have had to pay, but as we were not satisfied as to the lightning a detailed examination was made, and the animal was found to have been the subject of traumatic pericarditis, and the Company paid nothing.

There is some difficulty, however, in formulating a schedule of fees that will be fair to the practitioner, the Company, and the insurer, for the premiums may have to be raised, and that obviously may prevent some of the poorer and more necessitous farmers from taking advantage of insurance. However, it is necessary for us to look to our own side of the question. We

cannot afford to constitute ourselves into a philanthropic society, and we observe that the insurance companies usually pay very good dividends. To consider this matter, the South-eastern Society has elected a small committee, and it is probable that the other societies will be asked to do the same, and in the end the question should be carried through by the Council of the newly-constituted National Veterinary Association, which will be composed of representatives of the local societies. Probably the fairest scheme would be the payment of a fee for mileage travelled and a reasonable percentage of the premium with a fixed minimum. The question, however, will require very careful consideration, and we hope the various societies will join in the attempt to remedy the absurdly low fees paid for professional work.

G. H. W.

VETERINARY OFFICERS.

The Right Hon. Walter Runciman, M.P., President of the Board of Agriculture and Fisheries, has appointed a Departmental Committee to inquire into the requirements of the public services with regard to the employment of officers possessing veterinary qualifications and to consider whether any further measures can with advantage be adopted for the selection and training of students with a view to such employment. The committee will be constituted as follows: Sir Alfred Hopkinson, K.C. (chairman), Sir Thomas H. Elliott, K.C.B., Sir Thomas W. Holderness, K.C.S.I., Mr. H. J. Read, C.M.G., and Major G. F. MacMunn, D.S.O.. Mr. H. L. French, of the Board of Agriculture and Fisheries, will act as secretary.

JOHNE'S DISEASE IN CATTLE.

Mr. F. W. Twort, M.R.C.S., and Mr. G. L. Ingram, M.R.C.V.S., of the Brown Institution, Wandsworth Road, have just obtained a diagnostic reagent which, it is claimed, will enable Johne's disease to be recognized in its earliest stages. The reagent so obtained, if injected subcutaneously into an animal suffering from the disease, will cause a rise in temperature of from 4½ to 5½ degrees Fahrenheit, but has no effect on a healthy animal. Farmers and stockowners have been great losers by Johne's disease, which it had hitherto been impossible to recognize until it had so far advanced that the cattle affected were useless for breeding or milch purposes, and were of very little value to the butcher. When animals suffering from the disease are slaughtered, the flesh is not condemned as unfit for human food unless the carcase shows marked emaciation, so that an early diagnosis will allow of a better price being obtained for the animal for butcher's purposes.

General Articles.

SOME FURTHER RESEARCHES ON JOHNE'S DISEASE.

By F. W. TWORT, M.R.C.S., L.R.C.P., and G. L. Y. INGRAM, M.R.C.V.S.
The Brown Institution, University of London.

The Preparation of an Efficient and Specific Diagnostic Vaccine.

In our last paper (Royal Soc., B., vol. 84, 1912) we discussed various curative and diagnostic vaccines for Johne's disease, and pointed out that one of our vaccines, prepared by growing Johne's bacillus on broth containing 1 per cent. of human tubercle bacilli, gave a marked reaction with an animal suffering from Johne's disease *plus* tuberculosis and with those animals suffering from tubercular disease only. This and other experiments proved that the medium used was unsuitable for the preparation of a *specific* diagnostic vaccine. From further experiments we were led to recommend *Bacillus phlei* as the most suitable for the preparation of media, and we prepared some vaccines on these lines, but the only animal we had the opportunity of testing gave a negative reaction, probably due either to the disease being very far advanced or the dose of vaccine being too small.

Holth, of Copenhagen, has published results of some experiments with a vaccine prepared by growing Johne's bacillus on a medium containing a glycerine extract of the tubercle bacillus. A series of calves were inoculated with pure cultures of Johne's bacillus, tested some months later with ordinary tuberculin with negative results, and then with the special vaccine. They all showed some rise of temperature, whilst one gave a *typical* reaction. The author does not, however, give the rise of temperature obtained, but his result, in an animal apparently free from tuberculosis, is interesting, but as we have already indicated, to be specific the vaccine must be free from tubercle bacilli or their extracts. We ourselves have tested a vaccine prepared from a pure culture of *Bacillus phlei* only, as also has Bang,* with negative results in animals suffering from Johne's disease.

We have recently tested a vaccine prepared from a nine months' old culture of Johne's bacillus grown on ordinary glycerine peptone beef broth containing glycerine saline extract of

* 66de Beterning, &c., p. 41.

Bacillus phlei. This was first tested on three full grown bovines and on five calves about seven months old, and was inoculated *intravenously* in doses varying, according to the size of the animal, from 5 to 10 c.c. No. 1, a Jersey bull, and Nos. 2 and 3, Jersey cows, all showed typical clinical manifestations of advanced Johne's disease which they had contracted naturally. All these animals had several times been tested with ordinary diagnostic tuberculin with negative results. Each received 10 c.c. of the special vaccine, the temperature being normal at the time of inoculation:—

No. 1 gave maximum temp. of 105.0° F. in 1 hour.
No. 2 ,, ,, 106.1° F. in 5 hours.
No. 3 ,, ,, 104.8° F. in 4 ,,

Nos. 2 and 3 developed violent diarrhœa following the inoculation. We consider all these reactions positive.

The five calves, six months before the testing of this vaccine, had been inoculated with living cultures of Johne's bacillus isolated from the intestine of a calf in which we had produced the disease by the inoculation of a pure growth of bacilli. Of these five calves Nos. 1 and 2 were injected intravenously, Nos. 3 and 4 intraperitoneally, and No. 5 subcutaneously. Of the special vaccine, calves 2 and 3 received 3 c.c., and calves 1, 4 and 5, each 5 c.c.

Calves 2 and 3 showed no rise of temperature in 6 hours.

Calf 1 rose to 104.6°F. in 3 hours.

,, 4 ,, 105.0°F. in 6 ,,

,, 5 showed no rise in ten hours, but twenty-four hours after inoculation the temperature was 105.4°F. and slowly declined.

Through an unfortunate error the temperatures of calves 2 and 3 were not taken after the sixth hour.

A few days after these tests the five calves were killed and *post-mortem* examination made with the following results:—

Calf No. 1.—Typical lesions of Johne's disease and bacilli in the intestines and mesenteric glands. No tuberculosis.

Calf No. 2.—Slight lesions of Johne's disease in intestines; several acid-fast bacilli in lesions. No tuberculosis.

Calf No. 3.—Typical tubercular bronchial glands. No Johne's disease.

Calf No. 4.—Typical tubercular bronchial glands, and Johne's

disease in a moderately advanced stage, the bacilli very numerous near ileo-cæcal valve.

Calf No. 5.—Typical tubercular bronchial glands and tubercular lesion apex right lung. No macroscopic evidence of Johne's disease, but a few bacilli found beneath mucous membrane of ileo-cæcal valve and several in a mesenteric gland.

Cultures were made from beneath the mucous membrane of the intestine of all the cases, and the bacilli grew in all except Calf 3.

Growth of Johne's Bacillus on an Ordinary Laboratory Medium.

After repeated subculturing, and after living about 18 months outside the animal body, we succeeded in inducing Johne's bacillus to grow on ordinary glycerine liver broth. From this culture we prepared a vaccine and tested it in doses of 10 c.c. *subcutaneously* on two of the Jersey animals above-mentioned, ten and twenty-one days respectively having elapsed since the tests with the above-mentioned vaccine. In the latter case (twenty-one days interval) the temperature rose from 102.2° F. to 104° F., sufficient to show that the bacillus retained its power of producing a good vaccine in spite of growth having been only moderate in amount and of the slight variation or mutation which has taken place as evidenced by the bacillus growing on a medium free from acid-fast bacilli or their extracts. This strain now grows on ordinary glycerine beef broth.

Successful Inoculation of Goats with Johne's Disease, and Reactions with Vaccines in these Animals.

In July, 1911, we inoculated two young goats with living cultures of Johne's bacillus. Goat 1 intravenously, and Goat 2 with a much smaller quantity of bacilli intraperitoneally. Eleven months later Goat 1 was thin, but otherwise there was no clinical manifestation of the disease. They were tested with the first vaccine as used on the eight bovines described above, each animal receiving 3 c.c. *subcutaneously*.

Goat 1.—Showed temperature of 106.4° F. in nine hours, reached 106.6° F., and remained above 106° F. for eight hours, the reaction being accompanied by some diarrhœa.

Goat 2.—Temperature reached 105° F. in nine hours and 105.4° F. in ten hours, but there was no diarrhœa.

Both animals were killed, and on *post-mortem* examination both showed lesions of typical John's disease and typical Johne's bacilli, Goat 1 being affected in a greater degree than Goat 2. Johne's bacillus was isolated from both cases.

CONCLUSIONS.

From the experiments noted above the following conclusions may be drawn:—

(1) A diagnostic vaccine has been prepared which is specific for Johne's disease, and which will enable any owner of stock to eradicate the condition from his herd and to prevent its re-introduction by newly bought animals.

(2) The disease has been shown to be capable of affecting goats, and temperature reactions have been obtained in these animals with the specific vaccine, and it is probable that the condition demonstrated in deer by McFadyean in 1907, and by S. Stockman in sheep in 1909, is caused by the same bacillus that affects bovines.

(3) A slight variation or mutation of the bacillus has enabled one strain to be grown on ordinary laboratory media.

(4) The disease being thus demonstrable to an owner in its earliest stages, on the use of such a vaccine as is here described becoming general, *State legislation should be adopted, making slaughter compulsory*. No compensation would be called for, the carcase of an affected animal being saleable, and it being to the interest of the owner to remove a source of infection from his herd.

AUTOTHERAPY—ITS APPLICATION IN THE TREATMENT OF SEPTIC DISEASES IN THE HORSE.*

BY D. J. MANGAN, D.V.S.
New York, N. Y.

I HOPE I will be pardoned for attempting to handle such a formidable subject as vaccine therapy; and if my efforts to elucidate the action of autogenous pus when administered internally in septic diseases in the horse will interest you sufficiently to give this treatment a fair trial, I will feel amply repaid for any criticism which my lack of completeness is justly entitled to.

According to Wright, when an individual recovers spontane-

* From the *American Veterinary Review*. Read before the June meeting, Veterinary Medical Association of New York City.

ously from a bacterial infection, the cure is the result of the production of immunizing substances within the body fluids, evoked by the setting free of bacteria and their products from the focus of infection into the body; to this process Wright gives the name of "Autoinoculation."

We all know that opsonins are always present in healthy serum, and that phagocytes ingest and destroy invading bacteria, but are able to do this only after the bacteria have been acted upon by the opsonins.

Immunity according to this theory depends upon phagocytosis, and phagocytosis depends upon opsonins. Obviously, then, the degree of immunity depends upon the opsonic content of the blood. Later, it has been shown that the opsonins normally present are not the same as those developed in the production of immunity to a certain disease; *i.e.*, staphylococcus opsonins, developing as a result of a staphylococcus infection or resulting from the inoculation of a staphylococcus bacterin, prepare only staphylococci for ingestion by the phagocytes.

Streptococcus opsonins prepare only streptococci, &c. The opsonins normally present show no such specific action, but act upon all bacteria in much the same way.

It has been readily shown by absorption tests that opsonins act upon *the bacteria* and not by stimulating the phagocytes to increase activity; also by comparative tests, that the opsonic and bactericidal power of the blood serum in an infection do not run parallel, and therefore are distinct entities.

The present-day management of bacterial infections, outside of hygiene, sanitation, &c., is summed up in one word, immunity. Immunity means not only the non-susceptibility of an individual to a given disease and the power to resist the infection, but also the mechanism by means of which a cure is effected.

There are two forms of immunity, passive and active. Passive immunity is produced by injecting protective substances manufactured in the body of another animal; antitoxins. The diseases caused by bacteria that produce soluble extra-cellular toxins in their growth are the only ones from which antitoxins are made.

Most bacteria produce intra-cellular toxins, the toxins being bound up in the bodies of the bacteria.

Active immunity is the immunity induced by the production

of immune or protective substances within the individual. This is the form of immunity with which we here will deal. Wright's method of treating infectious diseases by small infrequent injections of sterile bacterial vaccines consisting of the organisms causing the disease has to a great extent revolutionized the treatment of bacterial diseases. Just how and why it acts, we may not be able to tell. We know it stimulates the immunizing apparatus into activity and that we are copying Nature's own methods; that is the spontaneous cure of infectious diseases by autoinoculations.

Massage, cupping, counter-irritation, Bier's hyperemic treatment, hot and cold applications, and may other forms of treatment act in this way, namely, increasing autoinoculation. This gives an ideal explanation of the beneficial results obtained in the application of mustard to the chest in pneumonia cases, where the infecting agent, with the products of its metabolism congregates in the lungs. This is really a form of natural autotherapy, or so-called autoinoculation. Injection of bacterial substances stimulates the body cells to produce the protective agents.

In case the patient has not sufficient vitality to react, the immunizing substances are not produced and the treatment fails; therefore, the earlier in the disease they are given the better will be the results. They should not be left as a last resort when the individual's vitality is exhausted.

In certain localized infections the body absorbs but little of the products of bacterial growths or antigens. Therefore, the amount of antigen absorbed being small, the amount of active immunity produced is slight. That is, little of the specific opsonins are formed, and those normally present are, to a large extent, used up so that the opsonic index is low and the disease tends to become chronic, or the part infected may be so badly damaged by the severity of the infection that the surrounding tissues are unable to react and form the necessary opsonins. In this case the inoculation of the corresponding bacterial antigen into a part distant from the site of infection where the tissues are injured is followed by an abundant elaboration of the specific opsonins which are delivered to the blood current, are taken to the infected part and reinforce the infected tissues in their fight against the invading bacteria. Again, the whole system may be overwhelmed by general bacterial infection, so that the specific

opsonins formed and those normally present are rapidly used up. Hence the opsonic index is very low and the body is helpless to resist the infection. Here it has been proved in many cases in human medicine that the subcutaneous injection of carefully graded doses of the corresponding bacterial antigen can increase the specific opsonins. For it is the connective tissues and particularly the loose cellular subcutaneous connective tissues that are, as a rule, the most active in the production on the antibodies.

Bacterial antigens should *never be given intravenously*, for there they would never increase opsonins. When injected into the body the proper place is in the above-described tissues; distant from the focus of the disease and uninjured, they are better able to respond to the stimulus.

Dr. Charles H. Duncan, of this city, has demonstrated that the administration of the crude autogenous pus per os will stimulate the manufacture of opsonins and bactericidal substances within the body fluids, as well, if not better, than the injection subcutaneously of autogenous vaccine. He has also shown that subcutaneous injections of the filtrable toxins will also give the same results.

This method of treating infectious diseases, of which he is the originator, has been called by him, and properly too, "autotherapy." The advantages of this treatment over autogenous vaccines are at once clearly manifested. It does away with the preparation of autogenous vaccines which, in addition to being tedious, is also expensive; likewise if this treatment is adopted it will dispense with the present hit and miss stock vaccines that are now in vogue.

There are many strains of each great group of bacteria. Some one has estimated that there are probably as many as seventy different strains of streptococci, and nearly as many different strains of the colon group, &c., so in using a stock vaccine it is readily seen what a small chance there is of getting the same strain of bacteria as the one causing the infection.

Many infections are mixed, and one is unable to determine which is the principal offending organism in order to administer a corresponding stock vaccine. But an autogenous antigen is obtained by the administration of the crude discharge, either in the mouth, or injections subcutaneously of the filtered toxins, enzymes, &c., of the discharge.

This is a natural vaccine and in giving it by these methods we are applying artificial autoinoculation which is the secret of the cure of infectious diseases.

My best results have been confined principally in cases of infections due to pyogenic bacteria, but its application promises to cover a large field of infections, and that primarily is the reason of my presenting the subject after such a limited experience with it, so as to enable others to determine to their satisfaction its efficacy in the treatment of infectious diseases in the horse.

In the light of our present knowledge of the defensive forces of the body fluids, any criticism of this method as crude is unjustifiable. This method is based upon a well-known scientific interpretation of autoinoculation in the spontaneous cure of infectious diseases. The brilliant results that I have witnessed after the application of this treatment has made me feel that to ignore it in pyogenic infections would be nothing short of criminal neglect on my part.

We may insist in bringing about a natural cure, or, in other words, specific anti-bodies may be developed, by direct inoculation, or by placing the autogenous toxic substances, developed during the course of the disease, directly into healthy tissues. This is the autotherapeutic method of cure.

Duncan's definition of autotherapy is: *That therapy which employs all of the autogenous nascent, toxic substances developed during the course of the disease against which the tissues react in a curative manner.*

The reaction against these toxic substances is the reaction against the disease.

When the infecting agents have been changed by growing in a *culture media outside of the body tissues or by time,* their therapeutic *value is lessened in proportion* to the change that takes place in them by the *various processes* which they undergo.

Duncan has proven that in extra-alimentary and extra-pulmonary diseases, if the toxic product of the disease is placed in the mouth it will tend to develop specific anti-bodies, and in intra-alimentary and intra-pulmonary diseases, if the toxic products of the disease be placed in healthy tissues outside of these systems, it will tend to develop specific anti-bodies. It must be remembered that it is healthy tissues that develop specific anti-bodies.

It is desirable to autoinoculate in many diseases; just how many, clinical experience alone will tell.

Pus contains all the toxic products of tissue changes, enzymes, ferments, and chemical changes in the protoplasmic molecule, against which the healthy tissues react in a curative manner. Besides *the pus and necrotic tissues being the ideal culture media, they contain the toxic substances derived from the causative bacteria.*

It has been shown when bacteria are in the blood stream (as it is claimed, bacteria have been found there in rheumatism in man), they develop few anti-bodies, but when injected subcutaneously they develop many anti-bodies.

Duncan likens autotherapy to a two-edged sword. It is doubly useful if handled by intelligence, but great harm may be done in the hands of the ignorant and careless. Autotherapy is not a cure-all; neither is any other therapy.

I have administered the crude pus to horses by three different methods.

First Method.—One c.c. to 3 c.c. of pus (necrotic tissue) depending upon the density of the discharge to 20 c.c. or 30 c.c. of water, mixed well in test-tube, pass through a Bunsen or alcohol flame until the solution begins to show a coagulation or curdling of its contents, then filter through a triple layer of sterile gauze; add one drop of phenol; 1.5 c.c. to 2.5 c.c. of the filtrate would be injected into the loose cellular tissue in the pectoral-axillary region. The dose graded according to the condition of the animal. The second dose not to be given for at least forty-eight hours, depending upon the clinical symptoms of the case; seldom would I administer the second dose in less than four days.

Second Method.—One tablespoonful (15 c.c.) of pus (if not enough pus collected can use the necrotic tissue, which is obtainable by scraping the parts), add enough water to make 6 oz. (180 c.c.), mixed thoroughly, and it is advisable to dispense it in a brown container so that the attendants do not become familiar with the contents. Give 1 oz. (30 c.c.) every hour until four doses are taken. Repeat if necessary the same dosage from three to six days later. In the meantime collect and save as much discharge from the wounds as possible, so as to be provided for future dosage.

Third Method.—One c.c. to 3 c.c. of pus, depending upon its

density, to 20 c.c. or 30 c.c. of water; shake well and permit the container to remain at about room temperature for eight to twelve hours; during that time give it an occasional vigorous shaking. Then place the mixture in a Berkefeld filter (No. 3-N-Med).

The filtrate contains only the toxic material of the bacteria and diseased tissues in solution. Our text-books tell us that most micro-organisms are endotoxic in character, but the use of the filter shows that the bacteria in the pus mixture permits a large quantity of their toxins to escape.

One c.c. to 2.5 c.c. is the dose to be injected in the above described regions, and to be repeated according to the indications and progress of the case.

The last two methods are according to Dr. Duncan's instructions and are the two I would suggest to be adopted. The first method is unreliable unless great care is exercised in its preparation. If it receives too much heat it is useless, and too little heat it is dangerous. Possibly in a water bath for about two hours at a temperature of 60° C. may be a good way to prepare the pus for injecting.

A dose of the autogenous antigen may be followed by a mild "negative phase" lasting hardly over twenty-four hours, to be followed in turn by a "positive phase" extending over several days. A proper sized dose will be followed by the transitory "negative phase" and then the "positive phase," which may last for several days.

The lesions, so to speak, are flushed with blood and an increased flow of lymph during this moderate "negative phase," when these substances carry a greater quantity of the protective agents of the body fluids, hence healing results.

A dose of autogenous antigen may do damage to an organism that has experienced numerous autoinoculations and is in a condition of constant "negative phase." If administered at all, only in the smallest doses, well diluted, may any help be hoped for in such cases.

Vaccines aid only in cases which have the necessary power to react to their stimulus.

In a hyperplastic area surrounding a suppurating focus, or located in a joint, the opsonins and anti-bacterial substances in the blood do not have free access. Any agency that will increase the local blood supply is indicated.

When the beneficial effects of the first dose or treatment of

the autogenous antigen is passing off, then it is time for another dose or treatment.

It is well to remember that as recovery progresses, intervals between the application of the treatment are gradually lengthened.

Most vaccine-therapists have discarded the opsonic count and rely entirely on careful observations of the clinical signs as the indicators for dosage.

The most important point to be remembered is that the earliest application of the vaccine or antigen will give the greatest number of cures, and as their administration does no harm, one should not hesitate even if the septic condition appears insignificant, particularly in our class of patients. If we wait until a pronounced permanent "negative phase" develops and the animal is in a generalized septic state, our results will not be very successful, but nevertheless hope should not be abandoned; the antigen may be administered in very small, highly-diluted doses, at very short intervals.

The recital of case reports is, as a rule, very tiresome and unsatisfactory to the listeners, but I ask you to bear with me for a short time while I relate briefly the results obtained in some cases that covered a wide field of infection.

Case No. 1.—Grey gelding of the draft type, having a large fluctuating fistulous abscess on the right side of the withers. Two doses of the heated pus were administered subcutaneously, the first given on October 18, and the second on October 22, 1911. The discharge took on a sero-sanguineous aspect the following day after the first injection. The animal made a complete recovery within two weeks. No microscopical examination was made of the discharge.

Case No. 2.—Bay gelding showing a very severe infection of fore point of the fetlock on the off fore leg. Microscopical examination revealed the presence of the necrophorus bacilli, streptococci and staphylococci. Multiple abscesses were forming around the joint and extending to the knee. Animal in great pain, places no weight on limb, temperature very high, the condition going rapidly beyond control. Four doses of the heated pus were injected subcutaneously, on December 10, 12, 17, and 24, 1911, respectively. The improvement was remarkable after the second dose, and the animal was ready for work in a month. Following the second dose the parts were actually bathed with lymph and had the appearance of liquid vaseline.

Case No. 3.—Black gelding having a generalized necrotic and abscess formation around the coronet and in the hollow of the fetlock due to a punctured wound in the frog. Five doses in all of the heated pus were injected, covering a period from December 21, 1911, to January 12, 1912. After the first dose the parts took on a flushed appearance and began to heal rapidly. Unfortunately the flexor pedis tendon had necrosed before the treatment was begun and had ruptured. Although healing was complete the animal was destroyed. The microscope showed the same infecting agents as case No. 2.

Case No. 4.—Grey gelding. Microscope shows the same micro-organisms as in case No. 2, and clinically and etiologically is the same as case No. 3; receiving five injections of heated pus, making a complete recovery in six weeks.

Case No. 5.—Dr. W. J. Magee's case. Bay gelding, showing a profound infection of the off fore foot and large necrotic areas. Microscope showed the smear covered with necrophorus bacilli, streptococci, staphylococci, and what appeared to be the *Bacilli pyocyaneus*. This case was treated with heated pus, and Dr. Magee was very favourably impressed with the results after the first dose, although the animal died. Dr. Magee attributes the death to the too frequent injections, bringing on a permanent "negative phase."

Case No. 6.—Buckskin gelding. The microscope showed a streptococcic infection of a wound on the hind quarters, that had become infected by using the same syringe in injecting it that had been used on a distemper abscess on another horse. This animal at the time of the treatment was in a prolonged "negative phase," showing numerous abscesses in different parts of the body. The injection of heated pus in small doses did not influence the course of the disease and the animal died from sepsis.

Case No. 7.—Bay gelding, brewery draft horse, suffering from a nail prick that had caused a suppuration around the coronet; great pain, high fever, no weight on foot. No microscopical examination of the discharge was made. This case took four doses of the heated pus before recovery became complete in five weeks.

Case No. 8.—Bay gelding; coronet, pastern, and fetlock one suppurating mass, due to a punctured wound in foot. Discharge of purulent synovia from original wound. No microscopical examination made. This case was fed with the purulent dis-

charge from the leg, and all the suppurating and necrotic areas began to heal, and parts were perfectly healed in five weeks, except a slight discharge of non-purulent synovia from the bottom of the hoof. All the digital articulations had become ankylosed and the animal was destroyed.

Case No. 9.—Grey gelding: a deep punctured wound reaching down to the coxofemoral articulation; yielded very rapidly to the administration of the crude pus per os.

Case No. 10.—Grey gelding, of a large heavy draft type; cellulitis of the entire right hind leg, apparently starting from a callosed area on the anterior surface of the pastern. The part was washed and hair clipped and a moist antiseptic dressing applied for twenty-four hours. Then the callus was raised off completely and the pure pus caught in a wide-mouth bottle. A pure strain of streptococci was shown under the microscope. This discharge was filtered through the Berkefeld filter, and only two injections were necessary to bring about a cure.

Case No. 11.—Grey mare (green), had been suffering from a very severe attack of influenza of the fulminating type. The attack under the regular treatment ran a very tedious course, until finally the temperature remained stationary at 102° F., pulse 60, and the animal refused to eat or drink and was in this condition for three days, when small petechia appeared in the left nostril; eight distinct petechia were counted. In the right nostril there were not so many. Along the abdomen were several œdematous patches about the size of a man's fist. The symptoms were undoubtedly those of purpura hæmorrhagica in the initial stage. The animal was injected subcutaneously with 2.5 c.c. of the filtrate of the discharge from case No. 10. The next day the condition of the animal was wonderful, temperature normal, petechia and œdematous swellings completely disappeared. Animal drank a pail of water and ate one quart of oats. A second dose was given four days later, and the animal made a rapid recovery.

Case No. 12.—Dark grey gelding, having a fistula of the withers of four weeks' standing. The parts were washed with plain tap water, and the next morning two tablespoonfuls of pus was collected and enough water added to make 12 oz. of the mixture. One ounce was given in the mouth every hour, until four doses were taken. By mistake the same number of doses were administered the next day, but without any harm being done.

The day following the first treatment, the discharge had changed to a decided bloody serous exudation, and about two drachms was all that could be expressed from the fistulas tract; the second day only a few bubbles of the discharge could be forced out, in comparison to the two ounces on the morning of which the treatment was commenced. The animal made complete recovery in three weeks. No microscopical examination was made of this discharge. Four treatments were all that was necessary in this case.

Concluding Remarks.—Strong antiseptic and astringent solutions are contraindicated, as a rule, when the autogenous antigen is being used, because such agents retard the outflow of lymph and blood which follows their use. Lymphogogues may be used in the place of such solutions. Sod. chloride four per cent. and sod. citrate one per cent. in boiled water is a good lymphogogue.

Generally speaking, the more severe the systemic infection the smaller should be the dose of antigen employed. Where very small doses are given, they may be given more often; in some cases daily minute doses being employed. When large doses are given the intervals between them should be lengthened. Finally too much should not be expected from this treatment, and it must not be considered as a cure-all.

Clinical Articles.

THE USE OF HYDROCHLORIDE OF UREA AND QUININE AS A LOCAL ANÆSTHETIC IN VETERINARY PRACTICE.

By GEO. H. WOOLDRIDGE, F.R.C.V.S.
Professor in the Royal Veterinary College, London.

I have used the above agent in a number of cases with very satisfactory results as a local anæsthetic, and the following four cases will serve to illustrate its usefulness:—

Case 1.—Amputation of the dew-claws of a fox-terrier. The patient, about 9 months old, was placed on the table, and after preparing the site I injected 1 c.c. of a 1 per cent. solution of hydrochloride of urea and quinine into each digit to be removed. The animal struggled and screamed at each insertion of the needle, this fact serving to emphasize the action of the agent. After an interval of twenty-five to thirty minutes the digits were

excised by making an incision in each case quite ¾ in. long and dissecting out the respective phalangeal bones, and finally suturing with fine silk. Throughout the whole operation there was not the slightest indication of pain, a very marked contrast from the patient's behaviour at the needle puncture. The wounds healed by first intention.

Case 2.—Mammary tumour of a cocker spaniel. The tumour in question was a large one, about the size of one's fist, so Inject. Morphiæ B.P. ♏ xxx was injected under the skin of the back. Half-an-hour later 4 c.c. of ½ per cent. solution of hydrochloride of urea and quinine with ♏ x of 1-1000 solution of renastyptin was injected round the base of the tumour. After a further interval of twenty minutes, and after suitable preparation of the site, the operation was commenced by an incision through the skin near the summit of the tumour, the mid-point of the incision being about 1½ in. away from the point of injection of the agent. There was a very marked flinching there, but no indication of sensation when the incision was extended to the immediate neighbourhood of the seat of injection. There was no pain around the base of the tumour, and there was practically no hæmorrhage, one small vessel being detected and ligatured before being cut. The operation wound, though large, did quite well and healing was rapid.

Case 3.—Mammary tumour in a fox-terrier. This was also a very large tumour, larger than one's fist, so morphia 1 gr. was first administered half-an-hour before the local anæsthetic. Hydrochloride of urea and quinine, 4 c.c. of ½ per cent. solution, was then injected, partly subcutaneously along the intended line of incision, and partly into the base of the tumour, and an interval of half an hour allowed to elapse before making the incision. The local anæsthetic was perfect, but no styptic action could be ascribed to the agent. The operation wound healed readily and without complications.

Case 4.—Shoulder tumours in a horse. This case consisted of two small tumours, each about the size of a walnut, and one on each shoulder. I injected 1 c.c. solution of hydrochloride of urea and quinine subcutaneously in each case. The needle was inserted from below upwards, and almost all the solution was injected over the upper part of the tumours. The first incision was made half an hour later. There was a complete

absence of sensation in the upper portion of the operation area, but flinching in the lower. The same conditions were repeated a few minutes later when the second tumour was excised. Two sterilized silk sutures were inserted in each case and healing took place by first intention.

Remarks.—It will thus be seen that hydrochloride of urea and quinine is quite an efficient local anæsthetic in the strength of 1 per cent. or ½ per cent. Its action, however, appears to be very limited in extent, and does not spread far from the seat of injection. It does not appear to possess any hæmostatic action, but it can be effectively used in combination with renastyptin or other suprarenal preparations. Compared with cocaine it is less toxic and much cheaper. It is slower in action, an interval of at least half an hour should be allowed between injection and incision, but its action is more durable. In fact, it has been claimed that some anodyne effect persists for several days. I have not been able to definitely ascertain that fact, but my patients not having interfered with or rubbed the wounds is consistent with that claim. I have, however, frequently noted some retarding of the healing of wounds after the use of cocaine, a fact not observed with hydrochloride of urea and quinine.

The preparation I used was conveniently put up by Messrs. Willows and Co., in 10 c.c. hermetically sealed tubes ready for use.

SARCOMA OF THE INTESTINE AND ENDOCARDITIS IN A HORSE.

By W. LOTHIAN, M.R.C.V.S.

Duns, Berwickshire.

The subject of this note was a thoroughbred hunter mare, with a good history as to health, and a good doer. She had been turned out to grass after the hunting season. She was noticed in the field to be dull and apparently not well. She was accordingly brought into the stable, and I was sent for next day.

On examination, the heart appeared to be the chief seat of the trouble. There was considerable disturbance, and the sound of the heart-beat consisted of a single thump. The pulse was soft but regular, and the temperature was normal. There was no colic, nor any symptoms indicative of abdominal trouble. The

treatment consisted of cardiac tonics and stimulants, but the patient died two days later.

A *post-mortem* examination was made the same afternoon. To my surprise, I found the abdominal cavity to be the seat of a croupous peritonitis, with a considerable amount of fibrinous, dirty-looking exudate and fibrin adherent to the peritoneum. Along the large intestine there was a number of large lumps in the bowel substance about the size of one's fist, and most numerous about the diaphragmatic flexure of the double colon. The mesenteric lymphatic glands were also enlarged and juicy. Of the thoracic organs, the lungs appeared to be healthy, but the heart showed a small warty growth affecting the right tricuspid valves, but different in character from the bowel lesions.

I forwarded a portion of one of the intestinal tumours to Professor Wooldridge, and on microscopic examination it was found to be a round-celled sarcoma.

CHRONIC ENDOCARDITIS IN A HORSE.

By J. F. MACDONALD, M.R.C.V.S.
London.

Subject.—Aged bay van mare.

This mare, on the morning of August 2, developed symptoms of brain trouble, *i.e.*, she was inclined to be comatose. However, soft food and physic apparently gave relief in a few days, and the mare was put back to work. About a week later she returned to the stable in the evening shivering, blowing, and very much off her food, temperature 104° F. She had been standing about for several hours in the wet with a cold wind blowing on her, and it appeared to be a case of chill. Diffusible stimulants were given, and the sides were stimulated by means of mustard. She was put in a loose box, and warm food and clothing, &c., provided.

Later a distinct dulness of the off lung developed, and though the temperature came down and the mare's general condition improved, this lung remained thick.

Some ten days after the commencement of the illness the mare had a relapse, the temperature going up to 103° F., with loss of appetite, &c. The pulse gradually became weaker, although never showing any irregularity, and the off lung re-

mained occluded, while a dropsical swelling appeared between the forelegs. No treatment did the animal any good, and she was eventually destroyed, having been sick some three weeks.

Autopsy.—Enlargement of the liver. Œdema of the off lung, with a single consolidated patch the size of a walnut.

The mare had been shot, consequently the brain was spoiled, but its previous congestion was no doubt due to the lesion in the right auricle.

The regularity of the heart and the absence of a jugular pulse seem unusual. Unfortunately no special auscultation of the heart was made. There was no history of any previous illness.

The heart was sent to Professor Wooldridge, who examined it, and reported as follows: "The mare's heart was affected with endocarditis, implicating the contact surfaces of both the auriculo-ventricular valves. There were enormous vegetations, as large as one's fist, on the tricuspids, and it seems remarkable that a sufficient amount of blood was able to get through for some time past. The bicuspid valve was intensely inflamed, being almost claret-coloured, but carried no vegetations. The cardiac lesion was undoubtedly the cause of the œdema."

AN UNUSUAL CASE OF POST-MORTEM HÆMORRHAGE IN A MARE.

By W. LOTHIAN, M.R.C.V.S.

Duns, Berwickshire.

On July 14 last I was asked to see a Clydesdale mare which had foaled early in the morning. She was 14 years old, always healthy, and had an easy foaling, more so than on previous occasions. Not much amiss was noticed, but the farmer thought her pulse was more frequent than it ought to be. When I arrived she was much worse: pulse 100; very weak; temperature 103° F.; mucous membranes pale; sweating profusely; looked weak and staggery. I had a strong suspicion of a rupture in the uterus, but could detect none. An unfavourable prognosis was given. A draught was administered; a solution of boric acid in boiling water (cooled down) was injected into the uterus.

15th.—A slight improvement.

16th.—Worse; evidently dying.

17th.—Dead. *Post-mortem* examination showed that a rup-

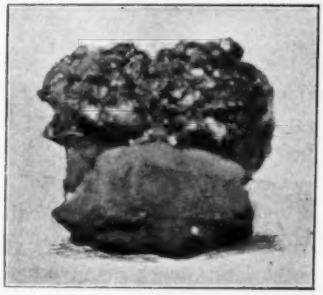
ture of one of the blood-vessels had taken place in the wall of the uterus, and although nearly a pailful of blood had escaped from the vessel the peritoneal covering had not given way, the blood being confined in uterine wall, which gave it the appearance of a large black tumour.

I may mention that a peculiarity of the mares on this farm is that nearly all of them after foaling require to have the fœtal membranes removed manually. It is not confined to one family or the progeny of one mare, although one old mare and nearly all her progeny have the fault. Often the membranes are firmly attached and difficult to remove. The farmer is always anxious to know the reason of this, as some run out all the year and others work. However, beyond removing them successfully, I have never been able to give him any satisfaction as to the cause.

AN INTERESTING ODONTOMA.

By ARTHUR DOBBYN, M.R.C.V.S.
Waterford.

The patient, a harness mare, about 11 or 12 years old, was observed by the owner to be getting thin and to be feeding capriciously. Upon examination of her mouth with a speculum I noticed an enormous enlargement of the third upper molar, which was loose.



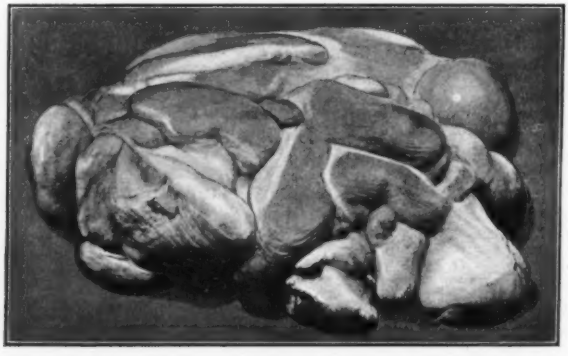
I had no difficulty in removing it with my fingers, and from that day the mare began to improve. Her mouth was dressed with antiseptic lotion and healed quickly without any further complications. The tooth and its surrounding structure weighed 7 ounces.

DIFFUSE LIPOMATOSIS IN A MULE.

By Captain H. A. STEWART, M.R.C.V.S., A.V.C.
Roberts Heights, South Africa.

On June 16, 1912, about 3 p.m., a mule of the Royal Scots Fusiliers was admitted to the Station Sick Lines, to all appearances suffering from exhaustion. The history of the case—light work previous to the attack—did not, however, justify this diagnosis.

Symptoms.—Pulse 70, weak and thready; respirations about 25; mucous membranes injected; temperature 102°; loss of appetite; anxious expression; slight diarrhœa; and inclination to lie down.



Treatment.—Well-bedded box; ammon. carb. ʒiv in bolus; and diffusible stimulants in drinking-water; bran diet.

About two hours after admission signs of improvement were noticeable, the animal walking round the box and apparently brighter.

Nothing further was observed wrong with the animal until about 5 a.m. next morning, when a Native reported him to be dying. A few minutes later death occurred without a struggle.

Post-mortem.—On opening the abdominal cavity the viscera were found covered with nodulated fatty masses, while in the folds of the mesentery and attached to the double colon was a nodulated fatty tumour 40-45 lb. in weight. On cutting into the nodules nothing but fat was found. An abnormal amount of blood-stained peritoneal fluid was present. The liver was in

a state of chronic venous congestion and had several small lipomata on its surface.

An *ante-mortem* clot was found adherent to the left auriculo-ventricular opening. This was doubtless the cause of death.

It seems extraordinary that the condition of animal's abdominal viscera should have made such little apparent difference during life.

The subject was a good-working mule with eleven years' service, and had no entries of importance on its veterinary history sheet.

THE ROARING OPERATION AS PERFORMED WITH A BURR.

By Dr. J. H. BLATTENBERG,

Lima, Ohio.

Roaring, due to laryngeal hemiplegia, has of late been successfully operated upon by Professor Williams, of Cornell (being now known as the Williams Operation for roaring), and by Professor Hobday, of London, who has performed the modified operation upon over 650 horses. Other operators, who have also operated successfully upon roaring horses by the latest method, are Professor Adams, of the University ot Pennsylvania, Professor McNeil, of Ohio State University, Dr. L. A. Merrilatt, and Dr. McKillip, of Chicago. The operation consists, briefly, of removing the mucous membrane lining of the sinus or ventricle at the back of the arytenoid cartilage which is affected owing to paralysis of the muscle controlling it, this being done without cutting any cartilage or the vocal cord. The healing process following the removal of the membranous sac, unites the arytenoid cartilage back against the wall of the larynx, thereby holding the thyro-arytenoidean ligament (or vocal cord) back also, thus preventing the roaring sound by the powerless or uncontrollable arytenoid cartilage and vocal cord reaching the middle of the larynx as previous to operation.

The burr simplifies the operation so that any veterinarian who makes a speciality of surgery can remove the ventricle sac with little difficulty. Briefly, it is performed in the following manner: Place the animal on its back by casting, or on a table, shave the space over the larynx and first few rings of the trachea; cleanse the field with antiseptic. If not giving a general anæsthetic, inject 2 per cent.

cocaine solution from about 1 and 1½ in. anterior to projecting body of thyroid cartilage to the first couple of rings of the trachea along the median line and make an incision through the skin, dividing the muscles about an inch anterior to the thyroid cartilage and posterior to the cricoid cartilage, laying bare these cartilages and the ligament connecting them, twisting any small bleeding vessels with forceps.

Insert the scalpel through the crico-thyroidean ligament, directing the point towards the trachea so as not to injure the vocal cords. Divide the ligament in the median line from the cricoid cartilage to the body of the thyroid cartilage.

Insert the retractor into the incision made through the ligament, thereby expanding the wound, a good light being essential, and a shaded electric bulb preferable. The vocal cords are seen distinctly, the one affected (usually the left) due to hemiplegia is quite discernible, remaining near the centre of larynx and quite immovable on inspiration. A spray of cocaine into the larynx will lessen sensibility. Insert the index finger as a guide to the burr, into the bottom of the ventricle at the back of the affected arytenoid cartilage, pressing lightly, as the weight of a burr alone when having reached bottom of ventricle is sufficient pressure ; give the burr half a turn or more to the right with the thumb and finger (as this mucous membrane is very delicate and too severe torsion will tear it, whereas if handled with delicate pressure and torsion it can be everted unbroken), when felt to be grasping the mucous membrane start to withdraw it, continuing the tension to the right only sufficient to keep the membrane sac grasping the burr till eversion of sac is almost complete with sac covering the burr in a twist.

Grasp the everted sac with long slender forceps below the burr and release the burr by turning back to left.

With sharp curved scissors first clip the attachment of sac beneath the lower edge of the vocal cord, care being taken not to injure it. Continue loosening or separating the attachment of the membranous sac with curved scissors. When removed untorn it can be placed over the end of the thumb of operator as a complete sac of mucous membrane, reaching one-half to two-thirds distance to first joint, like the thumb end of a kid glove.

No after treatment is required, unless from dyspnœa due to laryngeal swelling, in which case one may require a temporary tube to be placed in the trachea.

Canine Clinical.

ENZOÖTIC JAUNDICE IN THE DOG.

By E. WALLIS HOARE, F.R.C.V.S.

Cork.

Very little is known with reference to the ætiology and pathology of this affection. Blaine and Youatt described a similar disease under the heading of Distemper, but considerable doubt exists with reference to the existence of a hepatic form of distemper. It seems remarkable that a disease which causes such enormous losses in foxhound kennels should have escaped the attention of the pathologist, but the fact remains that up to the present time the practitioner is unable to suggest any efficient means for the prevention and treatment of the affection. In my experience the disease is most commonly met with amongst foxhound and otterhound puppies, and entire litters may be exterminated by it in a short space of time. At one time there was a prevalent idea that the surroundings of foxhound kennels had something to do with the causation of the malady, but as it is quite common in puppies sent to various parts of the country "to be walked," this view must be abandoned. One of the characteristics of the affection is the rapidity with which it develops, an animal apparently perfectly well in the morning being found seriously ill in the evening and showing well-developed icterus. The cases vary in severity; some show profound depression, and succumb in a comatose condition within four or five days. Others develop a milder form and recover. Some of the latter may show a relapse after an apparent recovery. Vomiting and constipation are frequent symptoms, and there is a total loss of appetite, the depression is profound, emaciation is rapid, and the affected animals lie in a helpless condition. The jaundice is usually extreme, all parts of the body being stained a deep yellow; a very fœtid odour is given off from the body. In a large number of cases, we observe, in a variable period prior to death, a distended condition of the abdomen, and careful examination in some instances will reveal the presence of a sausage-shaped tumour indicative of invagination of the intestine. But no evidences of pain are present, and without a careful examination of the

abdomen the presence of the invagination will be overlooked and will only be discovered at the autopsy.

In some cases hæmorrhage from the nostrils and from the gums is observed in the later stages, also hæmorrhage from the intestines; in almost every *post mortem* that I have made on cases of the disease invagination of the intestine has been present. In one instance the lesion was double; the ileum showed an extensive invagination at its anterior portion, and another of the ileum into the colon. The cause for this lesion is not easy to discover, as so far as one can judge the animal shows no movements of straining, and remains perfectly quiescent. There are no constant lesions of the liver; in some instances the organ is pale in colour, giving an appearance as if it was parboiled, in others it shows congestion, and is darker in colour than normal. In one of my last cases the liver was much enlarged and the gall-bladder was empty. A fairly common lesion is the presence of small ecchymoses on the lungs. I sent a blood-smear to Professor Wooldridge, who kindly examined it, but the result was negative. A hypodermic injection of trypan blue in one case proved of no benefit, but this was not surprising, as the autopsy showed a double invagination of the intestine. In the cases showing profound depression, treatment of any kind proves useless. In milder instances I have found the administration of calomel gr. 1/10th every four hours until the bowels are acted on to prove of benefit.

At the time of writing (September 15) I have a case under observation. The animal was sent in for treatment on September 14, showing the usual symptoms, but vomiting was absent. He took milk in small amounts. The depression was extreme. There was no distension of the abdomen. On September 16 blood with froth issued from the nostrils, and marked weakness was present. Careful examination of the abdomen did not reveal the presence of any invagination. Blood was passed with the fæces. The animal was destroyed with chloroform. The autopsy on September 16 showed an extensive invagination of the ileum into the colon, with well-marked enteritis of the incarcerated portion of gut. The liver was much enlarged and dark in colour. The gall-bladder contained a large amount of material that resembled gas-tar, and was adherent to the walls of the organ. The lungs showed extensive areas of ecchymoses on a pale surface. Similar ecchymoses were present on the peritoneal coat of the stomach. The duodenum was normal.

This disease urgently requires investigation, as the loss to masters of hounds is very great, some of the best pups of the season being carried off during outbreaks of the affection.

CHRONIC NEPHRITIS IN THE DOG.

By E. WALLIS HOARE, F.R.C.V.S.
Cork.

Every practitioner who makes it a rule to conduct autopsies must be struck with the fact that chronic nephritis lesions are of very common occurrence in the dog. What is still more surprising is that in a large number of instances no symptoms have been observed during life, and the lesions come as a surprise at the autopsy. It has happened on several occasions that dogs sent to the infirmary for treatment for chronic eczema have died suddenly, and it is difficult to persuade the owners that every care was taken with such cases. In every instance I have found that such animals suffered from chronic nephritis, although the owners stated positively that no symptoms of illness were ever observed.

Chronic interstitial nephritis is the most common lesion found, and it is frequently associated with hypertrophy of the left ventricle. In several instances, however, I have found the lesion to correspond with what is termed in human medicine the small white kidney, or the pale granular kidney.

It is of importance to recognize the fact that chronic renal disease occurs in the dog without the affection being suspected by the owner or the practitioner. Death without any apparent cause can often be traced to a latent affection of the kind, and in a disease such as canine typhus it is not uncommon to find renal symptoms at the outset due to an affection of the kidneys which was previously in existence. It is probable that the presence of a chronic renal affection may account for some at least of the fatalities occurring during chloroform anæsthesia in the dog.

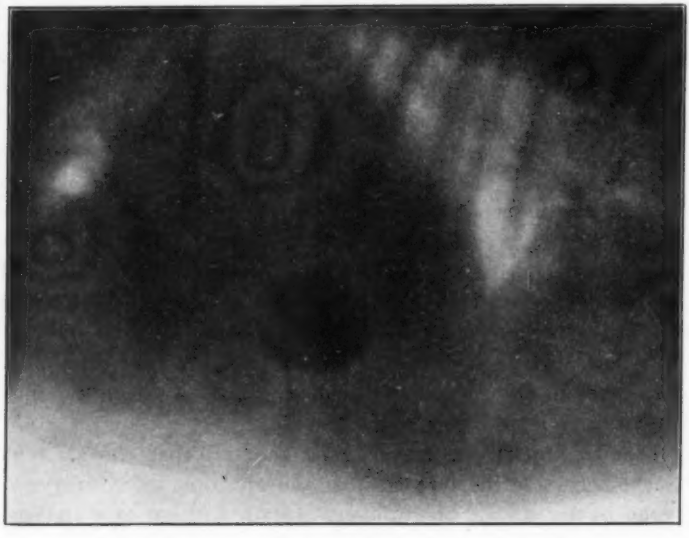
GASTROTOMY WITH REMOVAL OF A RUBBER BALL.

By FREDERICK HOBDAY, F.R.C.V.S.

Kensington, W.

THE patient, a well-bred bulldog, about 18 months old, was sent to hospital on February 24 of this year with the history of having swallowed a rubber ball which the owner had purchased for the animal to play with.

The symptoms shown were those of vomiting, especially after food or after any excitement, otherwise the dog seemed in excellent health and spirits.



Skiagraph showing the rubber ball in the stomach.

Whilst in hospital and kept quiet the vomiting ceased, and from previous experience of the unreliability of the statements sometimes made by owners as to what their pets had swallowed, we wished to be *quite* sure of the presence and nature of the foreign body before performing an exploratory laparotomy, and with this idea in view the dog was placed under the Röntgen rays and a skiagraph taken. The result both of exposure to the screen and of the skiagraph was to demonstrate beyond all possibility of doubt the presence of the ball in the stomach. As violent efforts at vomiting had failed to cause

its ejection by the mouth, and it was too large to pass along the intestine without causing a stoppage, it was decided that laparotomy must be performed without delay.

The operation was performed under chloroform on March 2, the median line being selected for the site of incision and the skin previously painted with tincture of iodine without washing or treating in any other way. The wound healed by primary union.

For four days no food was given by the mouth, the strength being kept up by predigested meat suppositories in the rectum every four hours, and only a teaspoonful of cold water allowed on the tongue at the same intervals. The patient showed no signs of fever or other disturbance, his only grievance being that he clamoured for food and could not get it.

On the fourth day a teaspoonful of Bovinine was given three times during the day in a tablespoonful of water, the suppositories being continued, and on the fifth day the Bovinine was increased to every four hours. On the sixth day Brand's essence of beef was given and the amount of water increased to two tablespoonfuls ; and on the eighth day a very small quantity of meat was allowed. This was gradually increased, and the patient was receiving fairly normal meals by the fifteenth, being sent home apparently quite all right on the twenty-first. There has been no relapse and no further cause for anxiety.

A REMARKABLE sale of Shorthorn bulls has been held at Buenos Ayres. Sixty-one bulls were sold for £28,879, an average of £483 a piece. The best price paid was £4,375 for Bapton Sunray, exported to the Argentine just over twelve months ago. He was bred by Mr. Deane Willis. Mr. Martinez de Hoz was the buyer. The bull Prince Augustus was sold for £3,833 to Mr. Bernardo Wirsch.

Personal.

MR. F. C. MINETT, M.R.C.V.S., Royal Veterinary College, London, has been awarded a research scholarship in Animal Pathology by the Board of Agriculture and Fisheries.

MR. J. QUINLAN, M.R.C.V.S., Royal Veterinary College of Ireland, has been appointed Lecturer in Veterinary Science at the Potchefstroom Agricultural College, Transvaal.

Abstract.

BOVINE TUBERCULOSIS IN RELATION TO HUMAN DISEASE.*

By W. G. SAVAGE, M.D., B.Sc.,

Medical Officer of Health, and Chief School Medical Officer for the County Council of Somerset; Author of "Milk and the Public Health."

This very large question involves the consideration of two separate problems—the amount of human tuberculosis which is of bovine origin, and the prevention of human tuberculosis from bovine sources.

Amount of Human Tuberculosis infected from Bovine Sources.

Data is steadily accumulating as to the extent of human infection from bovines, but we are not yet in a position to definitely state the exact percentage from this source. More or less reliable estimates may be arrived at from several points of view of which, in my opinion, the best is that based upon

Tabulation of Their own Cases.

Diagnosis of cases examined	Adults 16 years and over		Children 5 to 16 years		Children under 5 years			Total cases
	Human	Bovine	Human	Bovine	Human	Bovine	Both types	
Pulmonary tuberculosis ...	278	—	8	—	5	—	—	291
Tuberculosis adenitis (inguinal and axillary)	1	—	4	—	—	—	—	5
Tuberculous adenitis (cervical)	9	—	19	8	6	12	—	54
Abdominal tuberculosis ...	1	—	1	1	—	3	—	6
Generalized tuberculosis (alimentary origin)	—	—	—	—	1	1	—	2
Generalized tuberculosis ...	2	—	1	—	12	4	—	19
Generalized tuberculosis (including meninges)	—	—	—	—	18	1	1*	20
Tubercular meningitis ..	—	—	1	—	14	1	—	16
Tuberculosis of bones and joints	1	—	10	—	6	—	—	17
Genito-urinary tuberculosis	3	1	1	—	—	—	—	5
Tuberculous abscesses ...	1	—	—	—	—	—	—	1
Totals	296	1	45	9	62	22	1	436

* Double infection; both types isolated; child thirteen months old; the mesenteric nodes gave human type; meningeal fluid gave bovine type.

* From the *British Journal of Tuberculosis.*

the determination of the types of tubercle bacilli present in human cases. The English Royal Tuberculosis Commission investigated 108 cases of human tuberculosis other than lupus, but the most extensive records are contained in the very important paper of Park and Krumwiede* and their assistants. These investigators determined the type of tubercle bacillus present in tuberculous material sent to them from different institutions and from a variety of sources, and examined regardless of the type of infection. The tubercle bacilli were all, in the first place, isolated by guinea-pig inoculation. In addition, they also tabulated the results of their own and seventeen other groups of investigators into one combined table. Their own results and the combined results are shown in the two previous tables.

COMBINED TABULATION, CASES REPORTED INCLUDING THEIR OWN SERIES OF CASES.

Diagnosis	Adults 16 years and over		Children 5 to 16 years		Children under 5 years	
	Human	Bovine	Human	Bovine	Human	Bovine
Pulmonary tuberculosis ...	568	1 (?)	11	—	12	—
Tuberculous adenitis (axillary or inguinal)	2	—	4	—	2	—
Tuberculous adenitis (cervical)	22	1	33	20	15	20
Abdominal tuberculosis ...	15	3	7	7	6	13
Generalized tuberculosis (alimentary origin)	6	1	2	3	13	10
Generalized tuberculosis ...	28	—	4	1	28	5
Generalized tuberculosis including meninges (alimentary origin)	—	—	1	—	3	8
Generalized tuberculosis, including meninges	4	—	7	—	45	1
Tubercular meningitis ...	—	—	2	—	14	2
Tuberculosis of bones and joints	18	1	26	—	21	—
Genito-urinary tuberculosis...	11	1	1	1	—	—
Tuberculosis of skin ...	1	—	1	—	1	—
MISCELLANEOUS CASES						
Tuberculosis of tonsils ...	—	—	—	1	—	—
Tuberculosis of mouth and cervical nodes	—	1	—	—	—	—
Tuberculous sinus or abscesses	2	—	—	—	—	—
Sepsis, latent bacilli ...	—	—	—	—	1	—
Total	677		99	33	161	59

Mixed or double infections, 4 cases.
Total cases = 1,042.

* Park and Krumwiede: "Studies from the Research Laboratory, Department of Health, New York City," vol. v, 1910.

This table shows that the bovine type of bacillus was only found in 1.3 per cent. of the adults, but in 25 per cent. of the children 5 to 16 years, and in 26.7 per cent. of the children under 5 years of age. When the phthisis cases are excluded, the adult percentage rises to 7.3.

These investigations show that while pulmonary tuberculosis is almost invariably of human origin, a considerable proportion of the cases of other varieties of tuberculosis, especially glandular and intestinal affections in children, are infected with bacilli of bovine type, and derived from bovine sources. Whatever the exact proportion, it cannot be regarded as other than a serious menace to health.

Prevention of Human Infection from Bovine Sources.

Apart from exceptional circumstances, bovine infection to man is spread entirely from tuberculous meat and milk, including milk products. Of these milk, and to a lesser extent butter, is by far the most important, and must be regarded as the main vehicle of infection.

The problem of the prevention of human tuberculosis of bovine origin involves two quite separate considerations: (1) The control and elimination of bovine tuberculosis; (2) the prevention of human infection from material containing bovine tubercle bacilli.

The Control and Elimination of Bovine Tuberculosis.

The control of bovine tuberculosis is urgently required in the interest of agriculture, and quite apart from its relationship to human disease. The loss to the agricultural community from this disease is enormous.

The eradication of this disease amongst cows and oxen is admittedly an extremely difficult task, owing to the insidious nature of the disease and its extremely wide prevalence. The suggestion that all the cattle in the country should be tested with tuberculin, and all found tuberculous killed and compensation paid, is wholly impracticable since the amount of compensation required would be enormous, while no surety that the disease was extirpated could be arrived at, unless the animals surviving were all re-tested with tuberculin, and all imported animals regularly tested and re-tested. Apart from this, the killing of about 25 per cent. of all the milch cows in the country would cause a milk famine. All responsible veterinary authorities are united in advocating that measures for dealing with this disease must be on selective and preventive lines, operating somewhat slowly.

The best known method for the eradication of this disease is that of Bang, of Denmark. Delépine has advanced a modification of this method. In his method great importance is attached to the work of eradication not being confined to individual farms, or small groups of farms, scattered among other farms where tuberculosis is left entirely or partly unchecked. The principle

of both these methods is the separation of the healthy from the diseased animals, and the rearing of a healthy non-infected stock.

Ostertag's method is based upon the elimination of all cases of "open tuberculosis" from dairy herds. Vaccination of cattle against tuberculosis has also been advocated and practised, but in actual practice it has not given satisfactory results. Space will not permit a full description of these methods.*

The Prevention of Human Infection from Material containing Bovine Tubercle Bacilli.

The eradication of bovine tuberculosis is a long and difficult matter, and many authorities have taken definite action to try and prevent tubercle-infected milk from reaching the inhabitants under their control. For this purpose special legal powers have to be acquired.

Such powers were first obtained by Manchester, and they are usually known as the Manchester Model Milk Clauses.

These special powers have been in force in Manchester since

Tubercle Bacilli in Mixed Milk Samples (Percentages).

	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910
Manchester *	8.7	8.57	10.42	6.7	6.15	6.2	5.74	8.28	5.14	—
Liverpool, country samples †	6.1	7.3	5.1	9.2	3.8	6.8	4.7	3.3	1.8	4.1
Liverpool, town samples †	0.6	0.4	0.8	1.5	0.4	1.4	1.5	2.0	—	1.4
Sheffield, country samples ‡	—	17.8	16.7	6.7	14.7	9.6	9.7	9.9	10.9	10.4
Birmingham, country samples §	Prior to 1908 = 14 per cent.							11.3	7.5	7.3
Leeds, country samples || ...	—	—	—	—	—	—	—	25.3	16.4	—
Sunderland ¶	—	—	—	—	—	—	2.5	7.0	7.4	3.6
London (L.C.C.) ** ..	—	—	—	—	—	—	—	11.6	10.4	—

* Kindly supplied to me by Dr. Niven, Medical Officer of Health.
† Medical Officer of Health Report, 1910.
‡ *Ibid.*
§ Kindly supplied to me by Dr. Robinson, Medical Officer of Health.
|| Medical Officer of Health Reports, 1908, 1909.
¶ Kindly supplied to me by Dr. Renney, Medical Officer of Health.
** Medical Officer of Health, London County Council's Annual Reports, 1908, 1909.

1900, and in other cities for considerable periods, so that it is possible to obtain an estimate as to how far they have succeeded in attaining the objects for which they were framed. These milk clauses require notification by dairymen of all cases of udder tuberculosis among cows in cowsheds sending milk into the city, and prohibit the sale of milk from such cows within the city. They give powers for collecting milk samples and additional powers of inspection for cowsheds within the city.

* For a fairly complete description see the Writer's book, "Milk and the Public Health." London: Macmillan and Co. 1912.

Their essential and characteristic feature is, however, the power of inspection which they give of cowsheds and cows supplying milk into the city, although themselves outside, whenever the city authorities suspect milk from such farms to be tuberculous. The inspection can be followed up by prohibiting the infected milk from being supplied within the city as long as it is dangerous. The effectiveness of these powers may be considered from two points of view:—

(*a*) *Their Influence upon the Prevalence of Tubercle Bacilli in the Milk supplied to the City enforcing them.*—The tables above shows some of the results obtained in certain cities.

The Manchester figures are the most important, as they deal with a very large number of samples, extending over a series of years.

The table shows that there has been some diminution in the percentage of tuberculous samples, but that, apart from the first few years of working, it has not been continuous or very marked. During the first few years some of the worst offenders would doubtless be weeded out and warned off from supplying the particular city. The amount of tuberculous milk for Manchester drops to about 6 per cent., and to about 9 per cent. for Sheffield, and there it remains. No regular, consistent diminution in the infective quality of the milk is observable.

(*b*) *Their Influence upon the Prevalence of Udder Tuberculosis.*—The following table supplies some data:—

Year	Manchester *		Sheffield †	
	Percentage of farmers sending tuberculous milk	Percentage of outside cows found with udder tuberculosis	Percentage of country cows with udder tuberculosis	Percentage of city cows with udder tuberculosis
1901	9.9	1.4	—	0.47
1902	10.4	2.5	2.7	0.31
1903	13.6	1.1	0.96	0.45
1904	9.1	0.6	0.59	0.45
1905	8.3	0.9	3.9	0.26
1906	7.7	1.05	3.6	0.14
1907	6.76	1.1	1.9	0.8
1908	9.34	0.9	2.4	0.9
1909	5.79	1.03	4.0	1.1
Average	8.6	—	2.3	—

* From information kindly furnished by Dr. Niven.
† Report of Medical Officer of Health (Dr. Scurfield), Sheffield, 1909.

These tables show that the percentage of farmers sending tuberculous milk to Manchester varied from 5.79 to 13.6, the average being 8.6. Except for 1908, there has been a steady, though not very marked, decline since 1903. In other words, there has probably been a moderate but steady diminution in the

number of farms with cows suffering from open tuberculosis sending milk to Manchester.

As regards udder tuberculosis, the table shows no percentage diminution in either Manchester or Sheffield. In Sheffield during 1909, the veterinary inspectors found as many as forty-two cows with tuberculosis of the udder, out of about 3,600 cows stalled in Sheffield City.

Judged from these two points of view, these special powers have (apart from their initial effects) only attained a moderate measure of success, as regards their effectiveness to protect the community obtaining them against the dangers of bovine tuberculosis spread by milk.

Several considerations, apart from actual results achieved, show that markedly beneficial results of a permanent character are not likely to accrue. Thus a consideration of the powers given, and the clauses themselves, show that they are essentially based upon an assumption which cannot be accepted without large reservations. The assumption is that the presence of tubercle bacilli in milk is due to the herd supplying the milk containing one or more cows affected with clinically recognizable udder tuberculosis, and if these cows are removed the danger ceases.

This assumption, in view of the findings of the Royal Commission on Tuberculosis, and of other investigators, cannot be accepted as true. In further support of this statement may be instanced the fact that in a considerable number of cases in which tubercle bacilli are found in milk no cases of udder tuberculosis which can be diagnosed are found. Apparently the cow-keeper in such cases may continue to send unchecked his milk into the city.

Again, action along the lines of the milk clauses must fail to effectively deal with the whole problem, since they attempt to treat a symptom; they do not treat the underlying condition—bovine tuberculosis. Applied to special areas only, as already mentioned, they exert a practically negligible influence upon the manufacture of bovine tuberculosis (although they may divert its products to unprotected places) but merely deal with the small amount of it which comes under their special cognizance. If the clauses were universally applied they would no doubt be made much more effective, but even then the powers given are insufficient.

One of the greatest weaknesses of the clauses is the absence of powers to deal with a cow with udder tuberculosis when found. She is difficult to diagnose and a potent danger to mankind, and yet when the elaborate business of bacteriological examination and veterinary inspection reaches its fruition and a cow with a tuberculous udder is found, all the law mildly enacts is:

(1) The cow owner must not keep or permit such cow to be kept in any field, shed, or other premises along with other cows *in milk** under a penalty.

* The italics are mine. Apparently she may be kept with calves or cows now dry which will soon again be in milk.

(2) The milk of such a cow shall not be mixed with other food, and shall not be sold or used for food of swine, or other animal, unless and until it has been boiled.

In other words, the owner can banish the cow from other cows in milk and stop using her milk, and then he has fulfilled the whole of the law. There is apparently nothing to prevent him selling the cow with or without saying anything about the udder condition.

It is well known that the powers granted are less than those originally asked for, and the slaughter of cows suffering from udder tuberculosis was one of the clauses which Parliament failed to endorse.

Practical Procedures.

In my opinion, while immediate action is required to deal with existing conditions, and to prevent tubercle bacilli being shed into milk from cows with tuberculous udders or clinically diagnosable tuberculosis, the real lines of prevention are to help and encourage the farmer and breeder to eradicate tuberculosis from their herds. The former is a necessary measure, but it is only a palliative.

There is no doubt that the community for its own interest and protection will have to financially assist the farmers in the fight against bovine tuberculosis. The present policy of inactivity, or of localized efforts to diminish tubercle bacilli in milk, can never do permanent good, and money can be better employed in other directions. There appears to be a good deal of difference of opinion as to the directions in which financial assistance should be given. In Denmark compensation is paid for cows slaughtered. It might be reasonable, and probably would be politic, if any general scheme of prevention is inaugurated, to pay compensation for such animals for perhaps the first two or three years, but after that, if any cows with advanced tuberculosis are found in cowsheds, the owners should be fined. Any compensation should be paid out of Imperial rather than local funds, otherwise the urban districts do not pay their share. All cows excreting tubercle bacilli, if not killed, should be branded so that they may never be used for milk production.

To find out such animals, an adequate staff of veterinary inspectors must be provided, while bacteriological facilities will have to be much more extensively employed. Assistance to farmers and breeders should be in the direction of the free supply of tuberculin and the free services of veterinary surgeons. The public must also be educated so that they will be willing to pay more for milk guaranteed free from tubercle bacilli than for ordinary market milk.

It would be a decided advantage if at least a few farms supplying milk from non-tuberculous cows could be obtained for each large urban area such as they are doing in Birmingham.

Review.

The Food Inspector's Encyclopædia. By A. Horace Walker, M.D., Sanitary Institute. Published by Baillière, Tindall and Cox. Pp. vi. and 303. Price 7s. 6d. net.

It is a disgrace to England that it should be possible for any author to be able to commence the preface of a book with the mention of the fact, unfortunately only too well known, that "During recent years attention has been specially devoted to food inspection." Unfortunately, it is only of "recent" years that England has commenced to awaken on this point, and even now the general system of food inspection, when the whole country is taken into consideration, is far behind that of the Continent, and even of New Zealand and others of our Colonies. Books on food inspection are not so numerous yet that they have become a drug in the market; they are very welcome, and Mr. Walker's is particularly so in that it has struck a new idea by giving to the meat inspector a work of handy reference. If any fault at all can be found it is that the descriptions given are in some instances somewhat too brief, but we are sure that this will be remedied in the next edition; and we are equally sure that the book will speedily reach that stage, as it is sure to find a ready sale.

Hardly, perhaps, scientific enough to be of use to the duly qualified veterinary inspector it will, however, be of value to the recently appointed man, on account of the lucid explanation it gives of the various colloquial terms used by the butchers and other dealers in food. The descriptions of the meat diseases of animals, birds and fish are put in clear language without a lot of puzzling technicalities. The different distinguishing features of flesh, such, for example, as cat *versus* rabbit, and goat *versus* mutton, &c., are explained in detail, whilst fruit, cheese in all its varieties, together with glucose, golden syrup, glycerine and other articles found in the shop of the grocer and subject to adulteration (or used as adulterants) are touched upon.

Alphabetically arranged the book is a true encyclopædia of knowledge of the subject dealt with, and no meat inspector can afford to be without it on his bookshelf.

Translations.

THE VALUE OF ARECA NUT AND KAMALA IN HELMINTHIASIS.

By R. HOELT.

Both drugs together with castor oil in capsule form produce very good effects. Preparation of the subject is however very important. For a few days a milk diet until the fæces become pulpy ; on the day of administration half ration of milk, half an hour later give the capsules [for small dogs three to six capsules, for large dogs six to eight capsules (Bengen & Co.)]. Intoxication is excluded. —*Der Tierarzt.*

THE BIOLOGICAL TREATMENT OF PERITONITIS.

By KUHN.

Kuhn recommends sugar therapy. He considers it to be a mechanical isolation means for the intestinal loops, influencing vegetative processes in the abdominal cavity, producing a chemical transposition of media, effecting also an antibacterial result and leading to the formation of anti-bodies. He recommends the washings of sugar in physiological concentration with the addition of sodium chloride 0·9, grape sugar 4·1, water 100, and gradually increase the concentration.—*Der Tierarzt.*

INVESTIGATIONS INTO THE SO-CALLED CHOREA OF THE DOG.

By MARCHAND and PETIT.

Marchand and Petit have examined histologically the nerve tissue of many dogs suffering from chorea. They come to the following conclusions:—

(1) Chorea of man has its anatomical substratum in the cortex of the brain and the cerebral ganglia; chorea of the dog is a medullary meningo-encephalitis.

(2) Chorea of man and of the dog do not compare with each other.

(3) The changes in chorea of the dog are of an inflammatory nature and are primarily situated in the vessels. The motor nerve-cells become affected secondarily.

(4) Chorea of the dog is mostly similar to infantile paralysis and its epidemic form poliomyelitis acuta.

(5) The difference in the symptoms of disease in man and the dog is probably due to the fact that the spinal marrow in the dog possesses greater functional independence than in man.

(6) The word " chorea " is quite unsuitable and, judging from the clinical appearances, the designation " rhythmic paralysis " seems much more suitable.—*Deutsch. tierarzt. Woch.*

THE ACTION OF NOVOCAIN AS A LOCAL ANÆSTHETIC.

By District Veterinary-Surgeon DORN,

Markt Erlbach, Bavaria.

I am publishing the following short note on Local Anæsthesia in order to interest veterinary circles more widely. Fuller details will be given in a later publication.

General narcosis by inhalation without expert assistance is a difficult undertaking even with horses, and with cattle it is absolutely out of the question. Hitherto I have mostly employed the Fröhners chloralhydrate method per rectum. I have also tried it intravenously in some cases without meeting with any disadvantage. The principal points to be observed are adequate dilution (2 to 30), warming to 104° F., and injecting by means of the infusion apparatus, but such methods do not appeal to everyone, and many would rather rely upon the casting methods for operations, or leave severe operations alone altogether.

Most of the remedies both in human and veterinary work, as we see from literature, have been tried only on the horse and dog, and not upon cattle. I have myself first tried cocaine and then stovaine with either adrenalin or with synthetic adrenal preparations. With horses both are good, and with cattle I only obtained satisfactory results in actinomycosis and in some eye operations. For a long time I have now used for local anæsthesia novocain in combination with suprarenin, a synthetic adrenal preparation. I obtain both in sterilized solution in sealed glass tubes according to the following formula:—

Novocain	1.0
Suprarenin	10 drops.
Aqua destil.	10.0

As required I dilute the solution before operation with 2 to 4 oz. of water. I have carried out a series of operations, and obtained extremely good results. Thus a horse with a testicular botryomycosis nearly the size of a head, was operated on in three-quarters of an hour without exhibiting any signs of pain and without hæmorrhage owing to the action of the suprarenin.

In this case I used three tubes of the above solution diluted with 6 oz. of water.

A cancerous growth on both sides of the hind leg I was able to operate on without any necessity to hold the foot very firmly. In this case the solution was injected over the nerves on both sides above the fetlock. I have also tried the above solution on cattle in many cases. Smaller actinomycosis could be totally removed standing without any symptom of pain on the part of the animal. Complete anæsthesia was also obtained in the removal of a sclerotic growth the size of a hazel-nut in an ox, this being removed without any struggle on the part of the animal.

To induce complete anæsthesia in the case of tumours it is

absolutely necessary that a long injection needle is used (I myself used one 10 centimetres long), and to anæsthetize deeply round the field of operation. If the skin only is rendered insensitive by subcutaneous injection the enucleation may cause considerable pain. On the other hand if the injections are made deep into the tissues the superficial area is also rendered anæsthetic. Of course injections must be made around the field of operation.

After each puncture a few minutes are allowed to transpire, and if blood oozes out of the needle one draws it back in order to avoid injection into the blood-vessels.

The results I obtained induce me to consider that most operations in veterinary surgery can be carried out by this method without general narcosis.

The following table shows the lethal dose per 1 kilo. body-weight of novocain as compared with other local anæsthetics:—

SUBCUTANEOUS INJECTIONS.

	Cocain	Stovain	Novocain	Alypin
Rabbits	0.05-0.1 grm.	0.15-0.17 grm.	0.35-0.4 grm.	0.05 grm.
Dogs	0.05-0.07 ,,	0.15 ,,	0.25 ,, (not yet fatal).	0.07 ,,

Corresponding tests were made with intraspinal injection, showing the following results:—

	Cocain	Stovain	Novocain
Cats	0.018 grm.	0.025-0.05 grm.	0.15 grm. (not yet fatal).

A CASE OF BOTRYOMYCOSIS OF THE SHOULDER IN THE HORSE.

BY BÖTTGER,

Veterinary Surgeon.

A TWELVE-year-old black gelding belonging to the riding battery of the first Westphalian field artillery was brought to me in May of the previous year for treatment. There was a swelling about the size of the palm of one's hand on the left side of the withers, its surface was roughened and the hair on it stood up; there was a small hairless spot on it about the size of a bean in the middle of which was a scab covered with a few drops of glutinous secretion. The swelling felt moderately firm, was slightly hot, and painful on slight pressure with the finger. Treatment with acidulated compresses produced no result. The swelling on the withers extended much further and in fourteen days had spread over the whole of the left shoulder, in size and direction involving the shoulder-blade. This swelling felt as hard as wood, was not painful, and the skin over it was not movable. The gait of the horse and its general condition seemed to be in no way affected.

A collection of pus in the before mentioned swelling of the withers was operatively treated. The abscess cavity—about the size

of a walnut—from which a yellowish creamy fluid was discharged, had a lardaceous bed. A fistula canal led from it into the hard and lardaceous connective tissue. The canal ran in an oblique direction forwards and beneath the shoulder swelling. After thorough disinfection of the ailing part a convex opening was made at the base of the passage, and this was widened by a long and deep incision above and under the middle of the swelling. Through this the consistence and appearance of the diseased tissue could be examined. The swelling made up of pachydermatous, greyish white, hard, firm, fibrous tissue involved the skin and subcutaneous tissue. In the yellowish sodden surface of the incision little whitish grey points, the size of a small grain of sand, were embedded.

The depths of the fistula canal contained a few drops of an ichorous purulent fluid. The walls were tough and covered with yellowish grey granulative tissue.

Operative treatment was resolved on. The diseased tissue was dissected out, the wall of the swelling swabbed out with silver nitrate solution, the wound tamporised and sutured. After four weeks the horse made a complete recovery and could be used for all his ordinary work.

Microscopic examination showed the swelling to be caused by *Botryomyces equi*, probably introduced and penetrating by the slight injury to the withers.—*Zeitschrift für Veterinärkunde.*

ARECOLIN-VERATRIN AS A DIAGNOSTIC OF PARALYSIS OF THE STOMACHS DUE TO A FOREIGN BODY IN CATTLE.

By HOLTERBACH.

Recurring indigestion which obstinately resists the usual treatment leads one to suspect an incurable paralysis. This is caused in most cases by a foreign body. Yet it may be otherwise. Holterbach saw a case of myxœdema of the mesentery as a result of chronic degeneration of the thyroids which had caused paralysis of the stomachs.

In all these cases there is generally incurable paralysis of stomachal and intestinal movement. It is known that cattle suffering from such changes may live, work, and give a satisfactory milk supply for a long time without showing severe symptoms of illness. In these cases arecolin-veratrin in combination are of great value. When in such cases regular peristalsis of stomachs and bowels does not arise after repeated doses of these drugs, even if the animal shows no severe symptoms, it is worth while to consider the question of slaughter. This should always be done in advanced cases in which the attacks of indigestion are obstinate and accompanied by paralysis of the stomachs. If such resist two courses of five doses of arecolin and five doses of veratrin (Bengen, Hanover) administered in a space of eight days, then incurable paralysis is present, and immediate slaughter may be advised.—*Der Tierarzt.*

OBSERVATIONS ON COLIC DUE TO WIND-SUCKING.

By Staff Veterinary-Surgeon Dr. GOLDBECK.

In an Army horse I had an opportunity of observing an interesting developing case of colic through wind-sucking. The horse, as a young remount, commenced to develop the habit, and swallowed so much air that repeated cases of colic occurred which disappeared, however, later. Consequently, in the year 1906, a crib-biting strap, with a neck-iron, was used. After putting in the strap the horse no longer evinced the bad habit, and further, no attacks of colic occurred. During the last manœuvres the strap was lost. In the manœuvres themselves the horse showed no symptoms of colic, as during the strenuous time of the operations no time was given him to exercise his bad habit. After returning to garrison, the horse cribbed continually, and at 7 o'clock in the evening had pumped himself so full of air that colicky symptoms occurred. An examination undertaken at 8 o'clock showed the following condition. The animal was much distended, especially on the left side of the abdomen. Here a place was prominently seen, and underneath the intestine contained therein could be felt. The pulse was 60, the artery moderately stretched, respirations 35, laboured, mucous membrane dark red, intestinal movement not perceptible, only a little dung passed, water refused. The animal was brought into the fresh air and several buckets of water were introduced into the rectum. After introduction of the gag Marek's sound was passed. The use of this instrument in all cases known to me has been easy. The head is depressed somewhat downwards, so that, if possible, it is on a level with the neck, draw the tongue out of the mouth and pass the well-oiled catheter close along the hard palate. One hand holds it as near as possible to the hard palate. It is then pushed cautiously but rather quickly forward. In the neighbourhood of the larynx and pharynx there is a certain resistance, which is easily overcome. The horse generally obligingly swallows the catheter down. A slight rattling of a transient nature occurs. One now feels the catheter plainly in the œsophagus on further pushing it on. When introduced as far as the calculated measure previously taken on the horse, as a rule the streaming out of sour-smelling gases occurs at once. Any difficulty about the whole procedure never occurred.

According to Marek, one should now put a funnel on the catheter and let luke-warm water run into the stomach. This has never succeeded with me, since the œsophagus always lies higher than one can hold the end of the tube. Consequently I bind on this stomach catheter a suitable intermediate piece (generally also obtainable from Hauptner) with an irrigatory tube. In this way it is easily possible, under sufficient water pressure, to let as much water run in as one wants. Loosing the attached piece and holding the head down, the water runs out smoothly if stomach and anterior intestine are intact.

Here, in spite of the gas present, little of it came back,

and only a small quantity of the water introduced returned. From this it was concluded that a rent had occurred in the stomach or anterior intestine, through which the introduced water disappeared. This observation I had made in an earlier case, and established by *post-mortem*. It was naturally full of significance as regards prognosis, which was unfavourable.

In this case, also, although the symptoms were not violent and were eased somewhat later on by puncturing the intestine, death occurred at 3 a.m. *Post-mortem* showed rupture of the stomach, especially of its muscular and serous coats, but the mucous membrane also showed a hole as big as a five-shilling piece. A piece of the small intestine, about 6 in. long, 10 in. from its commencement, was completely and doubly twisted. I only mention here changes which had occurred *intra vitam*. The following observations arise from this case:—

(1) That a well-fitting wind-sucking strap for a recognized wind-sucker is essential for the avoidance of colic.

(2) Marek's œsophageal sound may serve as a very reliable diagnostic and prognostic aid, even in cases in which recovery does not occur through its use.—*Zeitschrift für Veterinärkunde.*

POISONING OF A HORSE WITH CORN-COCKLE (LYCHNIS GITHAGO).

By Staff Veterinary-Surgeon DUILL.

On December 27, 1911, a horse was taken ill with colic. He stood with sunken head partly supported in the manger, crouched to and fro, sought to lie down. Sweat covered his body. On calling to him he made no response. Conjunctivæ reddened, swollen, and slightly glassy. No intestinal sounds. Dung soft sodden, sour smelling, and containing undigested oats. Pulse weak, scarcely perceptible. Heart sounds perceptible, but beat not feelable. Breathing superficial, 28 per minute. Reflex irritability greatly diminished. Salivation profuse, with head outstretched at intervals of two to three minutes; then gurgling œsophageal sounds were heard, and saliva came away in streams from the mouth. Ability to swallow considerably hindered.

My diagnosis was intestinal catarrh conjoined with colic; cause, intoxication.

I first suspected feeding on mouldy bread, but the attendant assured me he had had none. Examination of the hay and straw showed both to be blameless. Examination of the oats gave an opposite result. They were full of black points. These proved to be corn-cockle with which the oats were infested. Seven grammes of corn-cockle were extracted from 500 grm. of oats. In the daily ration of 11 lb. of oats the horse partook of 77 grm. of corn-cockle. These oats had been fed from the beginning of December, so that the animal in this time had taken in 1,540 grm. of corn-cockle. In this case the peculiar poison called sapotoxin

contained in the corn-cockle was probably not split up and rendered inert. A second horse had received the same ration, but remained healthy, but the attendant assured me that he always left the black grains in the manger, whilst the sick horse ate them up.

As treatment the heart weakness was combated with caffeine injections, and further, the patient received a ball containing 20 gr. of extract of aloes and 5 gr. of calomel. In twelve hours the condition of the heart had improved. In thirty-six hours the patient had recovered.—*Zeitschrift für Veterinärkunde.*

SALIVARY AND VESICAL CALCULI.

By M. DOUVILLE.

(1) The subject was a five-year-old donkey, which for two years had shown a swelling, gradually becoming larger, along the course of Stenson's duct of the left side. There was a considerable amount of thickening of the skin over the course of the duct owing to repeated applications of counter-irritants, the lesion, in consequence, being badly defined. On palpation the swelling was found to be hard, fixed, and apparently causing no pain. These characteristics, the situation, and the slow development of the lesion led the author to diagnose a calculus.

The animal was operated upon in the usual manner; two incisions, each 5 to 6 cm. long, were made over the swelling, and converging at their lower extremity. The flap of skin on being raised revealed the calculus lying in the duct. After removal of the calculus the duct was probed in order to ascertain whether there were any obstructions to the flow of saliva, but the lumen was found to be patent. The opening was closed by a number of sutures inserted very close to each other, penetrating the skin and subcutaneous connective tissue only. The wall of the duct was not sutured. A blistering ointment was applied over the seat of operation. On the eighth day the stitches were removed and four days later the animal was considered to be cured. The calculus was ovoid in shape, 9 cm. long, and weighed 200 grm. The surface was smooth with the exception of the inferior portion.

(2) The second case occurred in a donkey mare: the animal made frequent attempts to micturate, passing but small quantities of urine at a time. On vaginal examination the bladder was found to contain only a small quantity of urine: the bladder was contracted and appeared hard when palpated. The animal resisted examination of the urinary meatus and the neck of the bladder. On passing the fourth finger into the urethra the author found gravel in the canal and he was able to detect a calculus in the bladder. There was a tendency for the calculus to lodge in the urethra. In spite of the fact that the urethra is short and that it can be easily dilated it was found to be impossible to withdraw the calculus without operation: it was therefore pushed forward into the bladder and vertical incision was made through the mucous membrane and some of the fibres

of the sphincter, along the roof of the urethra and the neck of the bladder. This caused very slight hæmorrhage, and enabled the operator to remove the calculus. The bladder was flushed out with boiled water and the patient sent home. A week later it was reported that symptoms had disappeared during the evening following the operation. Four months later the animal was considered cured, after vaginal examination and analyses of urine had been carried out.—*Rec. de Méd. Vétérinaire*, July, 1912.

GENERALIZED MELANO-SARCOMA IN A DOG.

By M. PETIT.

Melanosis is a rare condition in dogs, on the other hand it is not uncommon in horses, and in the latter is usually found in greys ; in this connection it is interesting to note that the subject in this case was black.

The dog was first under observation in October, 1910. Five months previously two small black "warts" were seen at the tip of the tail. These were, however, so inconspicuous that they were cut away when the dog's coat was being trimmed. The wounds did not heal, in spite of applications of tincture of iodine, of collodion, of the actual cautery ; later amputation had been resorted to, but the seat of operation was still ulcerated. It was at this stage that the patient was brought to the author. The surface of the ulcer showed black, suppurating centres ; there appeared to be no fistula nor any foreign body.

The base of the stump of the tail was normal in size, but the ischial glands, which usually cannot be located in the dog, were about the size of hazel-nuts ; they were hard and painless.

The patient's temperature was normal, but the dog was dull and had lost his appetite ; he was markedly losing condition. Purgatives and enemata were administered to overcome constipation.

Later the urine contained 2 grm. of albumin per litre and rectal examination revealed hypertrophy of the sub-lumbar and pre-pelvic lymphatic glands. The ischial glands discharged a black secretion, small in quantity, but thick in consistency (fistula). There was lameness in the right hind leg, but the cause could not be detected. Cachexia was followed by death.

The secretion from the ischial lymphatic gland was pus consisting mainly of polynuclear leucocytes, among which were large round cells containing a large amount of pigment ; these cells were evidently sarcomatous. Other round cells—large mononuclear, also contained pigment, but the polynuclear lymphocytes were free from melanin.

Lesions.—The caudal extremity was extensively ulcerated. The neoplasm appeared black and somewhat lobulated by strands of fibrous tissue. There were three small ulcers at the anus. On removing the skin, a chain of neoplasms was found extending from the coccygeal vertebræ to the sacro-iliac articulation. Most of these were subcutaneous, but some affected the muscles, whilst others

were in the thickness of the skin and had ulcerated on the surface. There were several other subcutaneous metastatic lesions in other parts of the body.

The parietal peritoneum showed a large number of small black granulations; the mesenteric glands were infiltrated with diffuse pigment. There were one large and several small lesions in the liver. The intestine showed two ulcers: one in the colon, six centimetres from the cæcum, affecting the whole thickness of the wall; the other, funnel-shaped, in the duodenum.

One lesion was found in one kidney, two in the other. The adrenals were extensively affected, but one tumour was not yet pigmented; this was a spindle-shaped sarcoma. Metastatic lesions were present also in the spleen, lungs, pleura, sternal and bronchial lymphatic glands. The walls of both auricles of the heart were affected. The brain and spinal cord as well as the lumbo-sacral plexus were free from secondary neoplasms.

The lameness in the right hind leg was probably due to pressure on the obturator nerve of one of the growths.

Histologically the neoplasm proved to be a melanotic sarcoma. One of the interesting features was the cavernous condition of some of the pulmonary lesions. The central part of the lesion had undergone softening, the soft part having become eliminated leaving a more or less thick melanotic wall. These neoplasms had discharged their contents in the bronchi, most of which contained coagulated mucus in which numerous pigmented bodies could be seen, either single or in masses. This condition could not be suspected during life, as bronchial mucus was probably swallowed.—*Rec. de Méd. Vétérinaire*, July, 1912.

SUCCESSFUL SUTURE OF THE JAWBONE IN A HORSE.

A THREE-YEAR-OLD colt, in biting at the door-frame of his box, violently struck the nape of his neck against the bar that took the place of the upper section of the door which was open.

The force of the blow fractured the animal's lower jaw; its free extremity was found to be hanging, owing to the transverse fracture of both jawbones close up to the neck. In each jawbone the fracture was equidistant from the corner incisor and the first molar.

After the patient had been prepared for operation, the external surface of the jaw was laid open, and the bone was drilled obliquely from bottom to top and from outside to inside, the punctures being about $\frac{3}{4}$ in. apart and parallel to the fracture on either side. A wire was then passed through the two courses from top to bottom, and then from bottom to top, so as to re-unite the ends of the fractured jawbone. They were then tightly drawn together to ensure cohesion. A similar suture was made on each side of the jaw. Antisepsis was assured by the free use of a 3 per cent. boric wash.

After the operation the patient was put back into his box and

tied up, wearing a collar the tether of which ended in a two-pound weight after having been passed through a pulley fixed in the ceiling above in such a way that the patient's jaw could not encounter any hard substance. A piece of sacking stretched out by four cords, also attached to the ceiling, served as a manger. The animal was fed with bran mashes and cooked grain, the mouth being sprayed twice a day with antiseptic water. Forty-two days after the accident the stitches of the suture were removed, and there was no unsightly exterior scar. The incisions were completely healed. Only two other similar successful operations had been recorded—one by Littlewood, and one by Professor Fontaine at Saumur in 1909.—*La Revue Vétérinaire.*

FOOT AND MOUTH DISEASE IN THE HORSE.

By de JONG.

De Jong noticed typical foot and mouth disease in foals pastured in a meadow with ailing cattle. Symptoms: Difficulty in taking food, salivation, vesicles in the buccal mucous membrane and tongue. He concludes on this account that regulations against foot and mouth disease should not be limited to ruminants and swine.—*Der Tierarzt.*

ITCHING OF THE SKIN IN THE HORSE AND ITS ABSOLUTELY CERTAIN CURE.

By KRONING,

Staff Veterinary Surgeon.

Kröning refers to the many applications used for that itching of horses which recurs periodically every summer and declines during winter. It is probably what is known here as "sweet itch," which most authors consider to be chronic eczema. After recording his failures with very numerous drugs, he pins his faith to a dressing recommended to him by Herr Gaüszetmann, which he has used with complete success.

The medicament used is an ointment consisting of "*naftalan*" 1 part, paraffinum molle 10 parts, with the addition of oil of turpentine, sufficient to soften the consistence of the salve. The method of treatment consists in cleansing the skin with a weak potash solution and subsequent smearing of all places attacked; the whole body can be dressed at one time without danger. Only two applications of the remedy are necessary.

Naftalan is a soap containing product of raw naphtha, and occurs in commerce as a blackish green, thick, ointment-like substance, at the price of $\frac{9}{10}$ths of a mark for 100 grammes. The substance has already obtained a good reputation in medicine. Naftalan may be recommended in fresh and purulent wounds, in chronic and moist eczema, in pruritus, in burns and excoriations, insect

stings and parasitic skin diseases, as well as in arthritis and tendo-vaginitis. Erber, in the *Zeitschrift für Veterinärkunde*, 1911, p. 271, records a case of itching cured with *nafalan*, which is a concurrent product of naftalan, and consists of 95 per cent. naphtha and 5 per cent. of soap.—*Zeitschrift für Veterinärkunde.*

Correspondence.

THE LATE PROFESSOR DICK.

To the Editor of THE VETERINARY JOURNAL.

DEAR SIR,—As I contemplate the preparation of a short account of the life and work of the late Professor William Dick, I should esteem it a great favour if those of your readers who are in a position to do so would give me any assistance which lies in their power. Any information regarding Professor Dick's life and teaching will be most gratefully received. Letters, books, photographs, &c., will be carefully preserved and returned to the owners with as little delay as possible.

I am, dear Sir, yours,

O. CHARNOCK BRADLEY.

Royal (Dick) Veterinary College, Edinburgh.
September 25, 1912.

Letters and Communications, &c.

Mr. F. Bullock; Mr. R. Branford; Mr. G. Wacher; Dr. C. Troester (Berlin); Mr. Willis; Mr. G. Dunlop Martin; Dr. Fantham; Mr. J. W. Hayes; Mr. Grasby.

Books and Periodicals, &c., Received.

Journal of the Royal Army Medical Corps; Recueil de Médecine Vétérinaire; L'Hygiène de la Viande et du Lait; Revue Générale de Médecine Vétérinaire; Der Tierarzt; Zeitschrift für Veterinärkunde; Berliner tierärztliche Wochenschrift; Osterreichische Wochenschrift für Tierheilkunde; La Clinica Veterinaria; Revista de Medicina Veterinaria; Board of Agriculture and Fisheries; Department of Agriculture and Technical Instruction for Ireland; Kennel Gazette; Agricultural Journals for the Union of South Africa and for Rhodesia; Williams's Surgical and Obstetrical Operations; The Food Inspectors' Encyclopædia; Spring-time Surgery (D. M. Campbell, D.V.S.); Revista Zootéchica; Manual of Poisonous Plants (Pommel); Dissection of the Dog (Bradley); American Journal of Veterinary Medicine.

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